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10/596,359	06/09/2006	Hajime Kando	36856.1450	5636

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EXAMINER	
ROSENAU, DEREK JOHN	

ART UNIT	PAPER NUMBER
2834	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/596,359	KANDO, HAJIME	
	Examiner	Art Unit	
	Derek J. Rosenau	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23-28 and 30-57* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-28 and 30-57* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Specification

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to **a single paragraph** on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 23-28, 31, 33, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itakura et al. (US 2002/0158549) in view of Taniguchi (US 2001/0008387) and Takayama et al. (US 20040174233).

4. With respect to claim 31, Itakura et al. discloses a boundary acoustic wave device (Fig 1) using a non-leaky propagation type boundary acoustic wave, comprising: a boundary acoustic wave element, including a single crystal substrate (item 4), a solid layer (item 6) provided on the single crystal substrate, and electrodes (item 5) arranged

at a boundary between the single crystal substrate and the solid layer (Fig 1); wherein the single crystal substrate has a cut angle (Paragraph 86).

Itakura et al. does not disclose expressly a plurality of boundary acoustic wave elements, the single crystal substrates of those elements having the same cut angle, or a propagation direction of a boundary acoustic wave of at least one of the boundary acoustic wave elements is different from that of at least one of the other boundary acoustic wave resonators, or that the thickness of the electrodes is set so that the acoustic velocity of an SH type boundary acoustic wave is lower than the acoustic velocity of a slow transverse wave propagating through the solid layer and the acoustic velocity of a slow transverse wave propagating through the piezoelectric single crystal substrate, or that $H>8261.744\rho^{-1.376}$, when ρ represents the density of the electrodes, H represents the thickness of the electrodes, and λ represents the wavelength of a boundary wave.

Taniguchi teaches a boundary acoustic wave device having a plurality of boundary acoustic wave elements (Fig 5), the single crystal substrates of those elements having the same cut angle (Paragraph 49), and a propagation direction of a boundary acoustic wave of at least one of the boundary acoustic wave elements is different from that of at least one of the other boundary acoustic wave resonators (Fig 5). Taniguchi also discloses that $H>8261.744\rho^{-1.376}$, when ρ represents the density of the electrodes, H represents the thickness of the electrodes, and λ represents the wavelength of a boundary wave. The claim language does not define the wavelength or

how to determine it; therefore, the wavelength can be any desired value. Therefore, the electrode thickness would meet the condition $H>8261.744\rho^{-1.376}$ for some value of λ.

Takayama et al. teaches a boundary acoustic wave device in which the thickness of the electrodes is set so that the acoustic velocity of an SH type boundary acoustic wave is lower than the acoustic velocity of a slow transverse wave propagating through the solid layer and the acoustic velocity of a slow transverse wave propagating through the piezoelectric single crystal substrate (Paragraphs 8 and 83). Although Takayama et al. does not disclose explicitly the functional language "so that the acoustic velocity of an SH type boundary acoustic wave is lower than the acoustic velocity of a slow transverse wave propagating through the solid layer and the acoustic velocity of a slow transverse wave propagating through the piezoelectric single crystal substrate," this would be inherent as Takayama et al. discloses the electrode thicknesses disclosed in the specification.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the plurality of boundary acoustic wave elements having different propagation directions of Taniguchi and the electrode thickness of Takayama et al. with the boundary acoustic wave device of Itakura et al. for the benefit of allowing for different electromechanical coupling coefficients within the same device (Paragraph 58 of Taniguchi) and of reducing the propagation loss (Paragraph 8 of Takayama et al.).

5. With respect to claim 23, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 31.

Taniguchi discloses that the plurality of boundary acoustic wave elements are boundary acoustic wave filters or boundary acoustic wave resonators (Paragraph 58).

6. With respect to claim 24, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 31. Taniguchi discloses that the plurality of boundary acoustic wave elements define resonators (Paragraph 58).

7. With respect to claim 25, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 31. Taniguchi discloses that the boundary acoustic wave device is a longitudinally coupled filter (Fig 5).

8. With respect to claim 26, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 31. Taniguchi discloses that the boundary acoustic wave elements are provided on a single piezoelectric single crystal substrate (Paragraph 58).

9. With respect to claim 27, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 31. Taniguchi discloses that an electromechanical coefficient of at least one of the boundary acoustic wave elements is different from that of at least one of the other boundary acoustic wave elements (Paragraph 58).

10. With respect to claim 28, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 31. Taniguchi discloses that a band width of at least one of the boundary acoustic wave

elements is different from that of at least one of the other boundary acoustic wave elements (Paragraph 55).

11. With respect to claim 33, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 31. Taniguchi discloses that $33000.39050\rho^{-1.50232}<H<88818\rho^{-1.54998}$. The claim language does not define the wavelength or how to determine it; therefore, the wavelength can be any desired value. Therefore, the electrode thickness would meet the condition $33000.39050\rho^{-1.50232}<H<88818\rho^{-1\cdot}54998$ for some value of λ.

12. With respect to claim 35, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 31. Taniguchi discloses that the electrodes each include a main electrode layer made from a material selected from the group consisting of Au, Ag, Cu, Al, Fe, Ni, W, Ta, Pt, Mo, Cr, Ti, ZnO, and ITO (Paragraph 61).

13. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Itakura et al. in view of Taniguchi, Takayama et al., and Takamine (US 20020135267).

14. With respect to claim 30, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 31.

None of Itakura et al., Taniguchi, or Takayama et al. discloses expressly that a duty ratio of the electrodes is set so that the acoustic velocity of an SH type boundary acoustic wave is lower than the acoustic velocity of a slow transverse wave propagating through the solid layer and the acoustic velocity of a slow transverse layer propagating through the piezoelectric single crystal substrate.

Takamine teaches a boundary acoustic wave device in which a duty ratio of the electrodes is set so that the acoustic velocity of an SH type boundary acoustic wave is lower than the acoustic velocity of a slow transverse wave propagating through the solid layer and the acoustic velocity of a slow transverse layer propagating through the piezoelectric single crystal substrate (Paragraph 64 and Table 1). Although Takamine does not disclose explicitly the functional language "so that the acoustic velocity of an SH type boundary acoustic wave is lower than the acoustic velocity of a slow transverse wave propagating through the solid layer and the acoustic velocity of a slow transverse layer propagating through the piezoelectric single crystal substrate," this would be inherent as Takamine discloses the IDT duty ratios disclosed in the specification.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the IDT duty ratio of Takamine with the boundary acoustic wave device of Itakura et al. as modified by Taniguchi and Takayama et al. as it has been held that optimization of a device, where the general conditions are met by the prior art, would be obvious to a person of ordinary skill in the art (*In re Aller*, 105 USPQ 233).

15. Claims 34, 43-48, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itakura et al. in view of Taniguchi, Takayama et al., and Nakahata (US 6025636).

16. With respect to claim 34, Itakura et al. discloses a boundary acoustic wave device (Fig 1) using a non-leaky propagation type boundary acoustic wave, comprising: a boundary acoustic wave element, including a single crystal substrate (item 4), a solid layer (item 6) provided on the single crystal substrate, and electrodes (item 5) arranged

at a boundary between the single crystal substrate and the solid layer (Fig 1); wherein the single crystal substrate has a cut angle (Paragraph 86).

Itakura et al. does not disclose expressly a plurality of boundary acoustic wave elements, the single crystal substrates of those elements having the same cut angle, or a propagation direction of a boundary acoustic wave of at least one of the boundary acoustic wave elements is different from that of at least one of the other boundary acoustic wave resonators, or that the thickness of the electrodes is set so that the acoustic velocity of an SH type boundary acoustic wave is lower than the acoustic velocity of a slow transverse wave propagating through the solid layer and the acoustic velocity of a slow transverse wave propagating through the piezoelectric single crystal substrate, or that that the piezoelectric single crystal substrate is $LiNbO_3$ substrate, φ of Euler angles (φ,θ,ψ) of the $LiNbO_3$ substrate is in the range -31° to 31°, and θ and ψ are in the range surrounded by the points A1 to A13 shown in table 1.

Points	Ψ(°)	Θ(°)
A01	0	116
A02	11	118
A03	20	123
A04	25	127
A05	33	140
A06	60	140
A07	65	132
A08	54	112

A09	48	90
A10	43	87
A11	24	90
A12	0	91
A13	0	118

Taniguchi teaches a boundary acoustic wave device having a plurality of boundary acoustic wave elements (Fig 5), the single crystal substrates of those elements having the same cut angle (Paragraph 49), and a propagation direction of a boundary acoustic wave of at least one of the boundary acoustic wave elements is different from that of at least one of the other boundary acoustic wave resonators (Fig 5).

Takayama et al. teaches a boundary acoustic wave device in which the thickness of the electrodes is set so that the acoustic velocity of an SH type boundary acoustic wave is lower than the acoustic velocity of a slow transverse wave propagating through the solid layer and the acoustic velocity of a slow transverse wave propagating through the piezoelectric single crystal substrate (Paragraphs 8 and 83). Although Takayama et al. does not disclose explicitly the functional language "so that the acoustic velocity of an SH type boundary acoustic wave is lower than the acoustic velocity of a slow transverse wave propagating through the solid layer and the acoustic velocity of a slow transverse wave propagating through the piezoelectric single crystal substrate," this

would be inherent as Takayama et al. discloses the electrode thicknesses disclosed in the specification.

Nakahata teaches a boundary acoustic wave device in which the piezoelectric single crystal substrate is $LiNbO_3$ substrate, φ of Euler angles (φ,θ,ψ) of the $LiNbO_3$ substrate is in the range -31° to 31°, and θ and ψ are in the range surrounded by the points A1 to A13 (column 9, line 65 through column 10, line 18).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the plurality of boundary acoustic wave elements having different propagation directions of Taniguchi, the electrode thickness of Takayama et al., and the crystal orientation of Nakahata with the boundary acoustic wave device of Itakura et al. for the benefits of allowing for different electromechanical coupling coefficients within the same device (Paragraph 58 of Taniguchi), reducing the propagation loss (Paragraph 8 of Takayama et al.), and improving the coupling coefficient (column 2, lines 29-42 of Nakahata).

17. With respect to claims 43-48 and 50, the subject matter thereof corresponds to that of claims 23-28 and 35; therefore, claims 43-48 and 50 are unpatentable over Ikatura in view of Taniguchi, Takayama et al., and Nakahata.

18. Claims 32, 36-38, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itakura et al. in view of Taniguchi, Takayama et al., and Nishiyama et al. (US 2007/0132339).

19. With respect to claim 32, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 31.

None of Itakura et al., Taniguchi, or Takayama et al. disclose that $\rho > 3745$ kg/m^3.

Nishiyama et al. teaches a boundary acoustic wave device in which the electrode may be made of a large number of materials, among them materials having densities greater than 3745 Kg/m^3 (Paragraph 32).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the electrode materials of Nishiyama et al. with the boundary acoustic wave device of Itakura et al. as modified by Taniguchi and Takayama et al. as the electrode materials taught by Nishiyama are well known for their use as electrode materials.

20. With respect to claim 36, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 35.

None of Itakura et al., Taniguchi, or Takayama et al. discloses that the electrodes each further include an additional electrode layer laminated on the main electrode layer.

Nishiyama et al. teaches a boundary acoustic wave device in which the electrodes each include an additional electrode layer (Fig 1F and 1G, item 5) laminated on the main electrode layer (item 4A).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the additional electrode of Nishiyama et al. with the boundary acoustic wave device of Itakura et al. as modified by Taniguchi and Takayama et al. for the benefit of providing a protective film for the main electrode (Paragraph 160 of Nishiyama et al.).

21. With respect to claim 37, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 36. Itakura discloses that the solid layer includes a dielectric substance (Paragraph 97).

22. With respect to claim 38, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 37. Itakura et al. discloses that the dielectric substance includes a material primarily composed of SiO_2 (Paragraph 97).

23. With respect to claim 41, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 37. Itakura et al. discloses that the solid layer includes at least one material selected from the group consisting of Si, SiO_2, glass, silicon nitride, silicon carbide, ZnO, Ta_2O_5, titanate zirconate lead piezoelectric ceramic, aluminum nitride, Al_2O_3, $LiTaO_3$, and $LiNbO_3$ (Paragraph 97).

24. Claims 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itakura et al. in view of Taniguchi, Takayama et al., Nishiyama, and Mishima et al. (US 20050099091).

25. With respect to claim 39, the combination of Itakura et al., Taniguchi, Takayama et al., and Nishiyama et al. discloses the boundary acoustic wave device according to claim 37.

None of Itakura et al., Taniguchi, Takayama et al., or Nishiyama et al. discloses that the solid layer includes a plurality of laminates, each of the plurality of laminates including a plurality of material layers.

Mishima et al. teaches a boundary acoustic wave device in which the solid layer includes a plurality of laminates, each of the plurality of laminates including a plurality of material layers (Fig 10, items 15 and 16).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the laminates solid layer of Mishima et al. with the boundary acoustic wave device of Itakura et al. as modified by Taniguchi, Takayama et al., and Nishiyama et al. for the benefit of preventing thermal damage during the manufacturing process (Paragraph 72 of Mishima et al.).

26. With respect to claim 40, the combination of Itakura et al., Taniguchi, Takayama et al., Nishiyama et al., and Mishima et al. discloses the boundary acoustic wave device according to claim 39. Mishima et al. discloses that the solid layer includes a layer primarily composed of SiO_2 (item 15) laminated to a layer primarily composed of Si (item 16).

27. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Itakura et al. in view of Taniguchi, Takayama et al., and Kadota et al. (US 5260913).

28. With respect to claim 42, the combination of Itakura et al., Taniguchi, and Takayama et al. discloses the boundary acoustic wave device according to claim 31.

None of Itakura et al., Taniguchi, or Takayama et al. discloses expressly that the boundary acoustic wave elements each further includes a resin layer adhered to the solid layer.

Kadota et al. teaches a boundary acoustic wave device in which the boundary acoustic wave elements includes a resin layer (Fig 9, item 29) adhered to a solid layer (item 5).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the resin layer of Kadota et al. with the boundary acoustic wave device of Itakura et al. as modified by Taniguchi and Takayama et al. for the benefit of simplifying the manufacturing process of the device (column 6, lines 59-68 of Kadota et al.) and better protecting the device by placing the device in a packaging material.

29. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikatura et al. in view of Taniguchi, Takayama et al., Nakahata, and Takamine.

30. With respect to claim 49, the subject matter thereof corresponds to that of claim 30; therefore, claim 49 is unpatentable over Ikatura in view of Taniguchi, Takayama et al., Nakahata, and Takamine.

31. Claims 51-53 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikatura et al. in view of Taniguchi, Takayama et al., Nakahata, and Nishiyama et al.

32. With respect to claims 51-53 and 56, the subject matter thereof corresponds to that of claims 36-38 and 41; therefore, claims 51-53 and 56 are unpatentable over Ikatura et al. in view of Taniguchi, Takayama et al., Nakahata, and Nishiyama et al.

33. Claims 54 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikatura et al. in view of Taniguchi, Takayama et al., Nakahata, Nishiyama, and Mishima et al.

34. With respect to claims 54 and 55, the subject matter thereof corresponds to that of claims 39 and 40; therefore, claims 54 and 55 are unpatentable over Ikatura et al. in view of Taniguchi, Takayama et al., Nakahata, Nishiyama, and Mishima et al.

35. Claim 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikatura et al. in view of Taniguchi, Takayama et al., Nakahata, and Kadota et al.

36. With respect to claim 57, the subject matter thereof corresponds to that of claim 42; therefore, claim 57 is unpatentable over Ikatura et al., Taniguchi, Takayama et al., Nakahata, and Kadota.

Response to Arguments

37. Applicant's arguments filed 10 October 2008 have been fully considered but they are not persuasive.

38. Applicant argues that none of Itakura et al., Taniguchi, Takayama et al., and Nakahata et al. discloses boundary acoustic wave devices. However, both Itakura et al. and Nakahata et al. disclose boundary acoustic wave devices, as can be seen in figure 1 of Itakura et al. and at least figure 40 of Nakahata et al.

39. Applicant argues that Takayama et al. does not disclose that "a thickness of the electrodes is set so that the acoustic velocity of an SH type boundary acoustic wave is lower than the acoustic velocity of a slow transverse wave propagating through the solid layer and the acoustic velocity of a slow transverse wave propagating through the piezoelectric single crystal substrate" However, this is simply functional language, which is not what Takayama was cited for. Takayama was cited for its teaching of electrode thickness, which in combination with Itakura et al. and Taniguchi, results in a device

having each of the claimed structural elements. As this combination has each of the claimed structural elements, the structure resulting from the combination would be capable of the same functions as the claimed structure.

40. Applicant argues that the device of Itakura et al. is a surface acoustic wave device, and that it is not a boundary acoustic wave device, saying that the silicon dioxide layer provided over the electrodes does not make the device a boundary acoustic wave device. However, a device may be both a surface acoustic wave device and a boundary acoustic wave device. The device of Itakura et al. generates a surface acoustic wave along the boundary between the zinc oxide layer and the silicon dioxide layer; therefore, the device of Itakura et al. is a boundary acoustic wave device.

41. Applicant argues that because Takayama et al. discloses only a surface acoustic wave device and does not disclose that "the acoustic velocity of an SH type boundary acoustic wave is lower than the acoustic velocity of a slow transverse wave propagating through the piezoelectric single crystal substrate". However, it is Itakura et al. that teaches a boundary acoustic wave device, and Takayama that teaches the electrode thickness that, in combination with Itakura et al., would result in the claimed functional limitations.

42. Applicant argues that Taniguchi does not disclose that "$H>8261.744\rho^{-1.376}$, when ρ represents the density of the electrodes, $H(\lambda)$ represents the thickness of the electrodes, and λ represents the wavelength of a boundary wave", arguing that λ can not simply be chosen arbitrarily, as the wavelength of a given acoustic wave device is determined based on the characteristics of the IDT electrodes. However, the claim

language does not contain any limitation directed to the characteristics of the IDT electrodes or the wavelength of the device; therefore, as the combination of Itakura et al., Taniguchi, and Takayama et al. discloses each of the claimed structural elements, the structure resulting from that combination would have the same properties.

43. Applicant argues that there would be no reason or motivation to combine the teachings of Nakahata et al. with the device of Itakura et al. as modified by Taniguchi and Takayama et al., arguing that the acoustic velocity of 8000 m/s is not a result of the crystalline orientation. However, it would be obvious to combine the teachings of Nakahata et al. for the benefit of improved coupling coefficient (column 2, lines 29-42). In addition, it has been held that optimization by routine experimentation would be obvious to a person of ordinary skill in the art (In re Aller, 105 USPQ 233). As the Euler angles of the lithium niobate crystals can be chosen by routine experimentation, it would be obvious to a person of ordinary skill in the art to select a crystal having Euler angles that yield the desired properties.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek J. Rosenau whose telephone number is (571) 272-8932. The examiner can normally be reached on Monday thru Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leung Quyen can be reached on (571) 272-8188. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quyen P Leung/
Supervisory Patent Examiner, Art Unit 2834

/D. J. R./
Examiner, Art Unit 2834